

REMARKS

Claims 1-5, 7, 10-22, 24, 27-49, and 51-60 are pending in this application. Claims 34-47 and 57 have been withdrawn.

In the Office Action dated December 9, 2005, the Examiner rejected claims 1-5, 7, 10-22, 24, 27-33, 48, 49, 51-56, 58, and 60 and objected to claim 59. In particular, claims 1-5, 7, 10, 15-20, 48, 51-56, 58, and 60 were rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,096,164 (“Benson”) in view of either one of U.S. Patent No. 6,082,660 (“Meyer”) or U.S. Patent No. 3,874,030 (“Knight”) and JP 05050515 (“Nakagawa”). Also, claims 11-14, 21, 22, 24, 27-33, and 49 were rejected under 35 U.S.C. 103(a) as being unpatentable over Benson, Meyer, Knight, and Nakagawa as applied above and further in view of either one of U.S. Patent No. 4,921,557 (“Nakamura”) or U.S. Patent No. 3,886,029 (“Poulsen”). Finally, claim 59 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Applicants would like to thank the Examiner for the interview on April 3, 2006, as summarized in the Interview Summary issued on that date. In light of the arguments below, Applicants respectfully request that the rejections of the pending claims be withdrawn and the claims be allowed to issue

Rejection of Claims 1-5, 7, 10, 15-20, 48, 51-56, 58, and 60
Under 103(a) over Benson in view of Meyer or Knight and Nakagawa

To establish a *prima facie* case of obviousness, the MPEP requires that the Examiner demonstrate (1) some suggestion or motivation to modify the reference or combine reference teachings; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. MPEP § 2142 (8th Ed., revised Aug. 2005). A *prima facie*

case of obviousness of claims 1-5, 7, 10, 15-20, 48, 51-56, 58, and 60 cannot be established based on Benson, Meyer, Knight, and Nakagawa, because these references do not teach or suggest all the claim limitations and because there is no motivation to combine these references to create the invention of the claims. Therefore, for these reasons, as described below, Applicants respectfully request that the Examiner withdraw these rejections.

First, the Examiner has not shown that Benson, Meyer, Knight, and Nakagawa teach or suggest “at least two winding eyes” that are “oriented such that each fiber bundle exits a winding eye in substantially the same plane as each other fiber bundle and at a specified distance from each other fiber bundle.” In the Office Action, the Examiner argues that in Benson the “plurality of openings that define comb 23 are seen to constitute the plurality of eyes in that the structure of Benson similarly contains gaps (openings) that function to provide a desired spacing between a plurality of fiber bundle - the term ‘eye’ is not seen to require any additional structure.” (Office Action at 4.) The Examiner further relies on Nakagawa for the proposition that the industry recognizes that a comb like structure constitutes an eye. (*Id.*)

As discussed during the interview and as conceded by the Examiner, Benson discloses only a comb 23 to separate the fiber bundles. *See, e.g.*, Figures 2-3, Col. 5, l. 57 - Col. 6, l. 46. As was also discussed during the interview, Applicants respectfully disagree with the Examiner’s assertion that the “comb” of Benson constitutes a “winding eye.” As can be seen from Benson, a “comb” forms only of a series of gaps that can only restrict the side to side movement of the fiber bundles as they pass through the comb. The gaps, however, cannot restrict the up and down movement of the fiber as they pass through the comb. Therefore, the comb is only capable of orienting the fibers in the horizontal plane, but cannot orient the fibers in the vertical plane. Thus, the gaps of the comb cannot be “oriented such that each fiber bundle exits a winding eye in

substantially the same plane as each other fiber bundle and at a specified distance from each other fiber bundle.”

For example, as explained during the interview, Figures 1-3 show that fibers may enter the winding eyes at different angles. The winding eyes, however, will cause the fibers to exit the winding eyes “oriented such that each fiber bundle exits a winding eye in substantially the same plane as each other fiber bundle and at a specified distance from each other fiber bundle.” In contrast, fibers entering the comb of Benson at different angles will exit the comb at different angles and, therefore, not in the same plane. This fact is acknowledged in Benson. Benson states the comb is used only “to keep the tows separated from each other,” while rollers orient the fibers. (Col. 6, l. 22-25.)

Moreover, Nakagawa does not support the Examiner’s assertion that a comb constitutes a “winding eye.” As was discussed during the interview, Nakagawa discloses a structure identified as a “traverse eye 50.”¹ The traverse eye, however, is comprised of both comb-shaped pins 502 consisting of gaps 501 and slit bars 503 forming a slit 504. It is the combined structure of gaps 501 and slit 504 that form the traverse eye 50. In contrast, as shown in Figures 5A-5B, winding eyes consistent with one embodiment of the Applicant’s invention, comprise only a single circular opening.

Therefore, the limitation of “at least two winding eyes” that are “oriented such that each fiber bundle exits a winding eye in substantially the same plane as each other fiber bundle and at a specified distance from each other fiber bundle” is absent from both Benson and Nakagawa. Since the Examiner has not asserted that Meyer or Knight discloses this element of the claims,

¹ Applicants have attached to this response a certified translation of Nakagawa for the Examiner’s convenience.

none of the cited references teach or suggest all the limitations of the claims. Therefore, a *prima facie* case of obviousness cannot be established. On this basis alone, the rejection of these claims should be withdrawn.

Second, as also discussed in the interview, Applicants respectfully submit that the Examiner's modification of Benson is erroneous. Benson teaches only the use of tows preimpregnated with resin. (Col. 4, l. 8-11.) The use of the combination of oriented winding eyes and curved rods, as claimed by Applicants, in the device of Benson would cause significant spreading of the tows, which would also cause the preimpregnated resin to separate from the tows. This would render the Benson device unsatisfactory for its intended purpose because it would affect both the curing of the fiber tows and the operation of the device itself due to resin intrusion in the device. When the "proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." MPEP § 2143.01 (8th Ed., revised August 2005).

Third, modifying Benson as the Examiner has suggested would change the entire principle of operation of the device and require major modifications. As a first modification, the Examiner acknowledges that Benson is a fiber placement device not a filament winding device as claimed, (Office Action at 3), but the Examiner asserts that Benson can act as a filament winding device. Even assuming the Examiner is correct (which Applicants dispute), Benson would need to be operated differently to wind the fiber as opposed to placing the fiber directly on a mandrel. (Modification #1). As a second modification, the Examiner acknowledges that Benson does not disclose curved rods to spread fiber tows, but the Examiner asserts that it would have been obvious to include such rods in the structure of Benson. Addition of these rods would require a further alteration of the device of Benson. (Modification #2). As explained above, the

use of curved rods in the apparatus of Benson as disclosed is not possible because Benson utilizes pre-impregnated fiber. Therefore, in order to utilize Benson with curved rods, as a third modification, the pre-impregnated fibers would need to be replaced with non-impregnated fibers. (Modification #3). But the use of non-impregnated fibers would in turn require that resin be introduced in to the fibers at another point in the device. Thus, as a fourth modification, a resin applicator would need to be added to Benson. (Modification #4). Finally, as acknowledged by the Examiner during the interview, and as a fifth modification, there would be no motivation to combine the traverse eye of Nakagawa with the device of Benson, because this would require an even greater modification of the device. (Modification #5).

As can be seen, therefore, the combination and modifications suggested by the Examiner would necessitate no less than four (and perhaps five) major modifications to Benson. These modifications would require substantial reconstruction and redesign of the device of Benson and would completely alter the principle of operation of that device. Thus, the combination of Benson, Meyer, Knight, and/or Nakagawa would also be similarly defective. In such circumstances, the teachings of these references do not demonstrate a motivation to combine the references and “are not sufficient to render the claims *prima facie* obvious.” MPEP § 2143.01 (8th Ed., revised August 2005). Therefore, for this additional reason, these claims are not obvious over the combination of Benson, Nakagawa, Meyer, and Knight.

Thus, because (1) these references do not teach or suggest all the claimed limitations and (2) there is no motivation to combine these references, Applicants respectfully request that the rejection of claims 1-5, 7, 10, 15-20, 48, 51-56, 58, and 60 be withdrawn.

Rejection of Claims 11-14, 21, 22, 24, 27-33, and 49 Under 103(a)
Over Benson, Nakagawa, Meyer, and Knight in view of Nakamura and Poulsen

A *prima facie* case of obviousness can not be established for claims 11-14, 21, 22, 24, 27-33, and 49 based on Benson, Meyer, Knight, and Nakagawa, in view of Nakamura or Poulson as well. Specifically, these references do not teach or suggest all the limitations of these claims, and there is no motivation to combine these references to create the claimed invention. Accordingly, Applicants respectfully request that the Examiner withdraw these rejections.

As discussed above, Benson, Nakagawa, Meyer, and Knight do not teach or suggest an apparatus or system having “at least two winding eyes” that are “oriented such that each fiber bundle exits a winding eye in substantially the same plane as each other fiber bundle and at a specified distance from each other fiber bundle.” Similarly, neither Nakamura nor Poulsen teach or suggest these limitations.

Nakamura discloses the application of multiple tows of fiber to a mandrel. *See, e.g.*, Figure 5. Nakamura, however, does not disclose winding eyes in any form, let alone winding eyes that are “oriented such that each fiber bundle exits a winding eye in substantially the same plane as each other fiber bundle and at a specified distance from each other fiber bundle.” Therefore, Nakamura does not teach or suggest these claimed limitations.

Similarly, Poulsen discloses only the application of multiple tows of fiber to a mandrel without a disclosure of winding eyes, curved rods, or fiber spreading. *See, e.g.*, Figure 1. Therefore, Poulsen does not disclose winding eyes that are “oriented such that each fiber bundle exits a winding eye in substantially the same plane as each other fiber bundle and at a specified distance from each other fiber bundle.” Therefore, Poulsen also does not teach or suggest these claimed limitations.

Since none of the cited references teach or suggest all the limitations of the claims, a *prima facie* case of obviousness cannot be established. Moreover, since neither Nakamura nor Poulsen add any teaching of the elements previously explained to be absent from Benson, Nakagawa, Meyer, and Knight, for the same reasons discussed above, there would be no motivation to combine these references to make the claimed invention. Therefore, because a *prima facie* case of obviousness cannot be established for claims 11-14, 21, 22, 24, 25, 27-33, and 49 over the cited references, Applicants respectfully request that the rejection of these claims be withdrawn.

Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: April 10, 2006

By: 

D. Brian Kacedon
Reg. No. 46,814